Department of Energy
Germantown, MD 20874-1290

SAFETY EVALUATION REPORT

for the
RMI Forged Billets (16-inch long only) in the Rev. H SARP
of the Steel Banded Wooden Shipping Containers (SBWSC)

Docket No. 99-23-5467

The criticality confirmatory evaluation in this Safety Evaluation Report (SER) addresses the RMI Forged Billets described in the Rev. H Safety Analysis Report for Packaging (SARP) for the Steel Banded Wooden Shipping Containers (SBWSC). The four types of RMI Forged Billets are all unirradiated annular cylindrical ingots with low U-235 enrichment, 1.25 wt.% for Mark I Outer and 0.95 wt.% for Mark I Inner, Mark IV Outer, and Mark IV Inner. The outer and inner diameters and the lengths of the RMI Forged Billets are given in Table 1.2.3-1 of the Rev. J SARP. The lengths vary between 16 and 21 inches. This SER addresses only the 16-inch long RMI Forged Billets.

The staff has reviewed the criticality analyses presented in the SARP and performed independent confirmatory evaluation of criticality safety for each of the 16-inch long RMI Forged Billets. The staff confirmed that the Transport Index (TI), and the number of packages proposed in the Rev. H SARP for each RMI Forged Billets in an exclusive use shipment, meet the 10 CFR Part 71 criticality safety requirements under normal conditions of transport (NCT) and hypothetical accident conditions (HAC).

Other non-criticality safety aspects (i.e., General Information - Chapter 1, Structural - Chapter 2, Thermal - Chapter 3, Containment - Chapter 4, Shielding - Chapter 5, Operating Procedures - Chapter 7, Acceptance Tests and Maintenance - Chapter 8, and Quality Assurance - Chapter 9) of the SBWSC have been reviewed for similar types of contents in the Rev. G SARP and documented in the SER for Rev. 11 of the Certificate of Compliance (CoC) dated July 15, 1999. The conclusions reached in the earlier evaluation and SER for the non-criticality safety aspects of the SBWSC remain valid and applicable to the 16-inch long RMI Forged Billets and will not be repeated here.

Chapter 6 - Criticality

6.1 Safety Evaluation

The staff has performed criticality confirmatory evaluation for the 16-inch long RMI Forged Billets and documented the results in the SER for Rev. 11 of the CoC dated July 15, 1999 based on the Rev. G SARP. In the Rev. H SARP, the applicant reduced the number of billets per package and recomputed the minimum TI values for the RMI Forged Billets of lengths between 16 and 21 inches (See Table 1 below). For the 16-inch long billets packaged in the SBWSC Model G-4255 in an exclusive-use shipment, the total number of billets based on the TI value in the Rev. H SARP is fewer than that specified in the Rev. G SARP. Since the previous confirmatory criticality evaluation has already demonstrated criticality safety for the 16-inch long billets in the Rev. G SARP, reducing the total number of 16-inch long billets (by reducing the

number of billets per package) in a shipment will only increase the criticality safety margin, and therefore requires no additional criticality confirmatory evaluation.

Table 1
Number of Billets per Package and Transport Index
for the RMI Forged Billets in the Rev. H and Rev. G SARP

RMI Forged Billets Type (16 in. L only)	^{235}U wt%	SBWSC Model	Billets/ Package, Rev. H (Rev. G)	TI Rev. H (Rev. G)
Mark I Outer	1.25	G-4255	2 (3)	14.3 (16.4)
Mark I Inner	0.95	G-4255	4 (5)	5.1 (4.8)
Mark IV Outer	0.95	G-4255	2 (3)	4.0 (4.5)
Mark IV Inner	0.95	G-4255	4 (5)	5.3 (5.0)

6.2 Summary

The staff has evaluated the criticality safety analysis presented in the SARP for the RMI Forged Billets of 16-inch length only. The staff has performed independent calculations and confirmed that the minimum TI values (and the corresponding maximum number of packages) for the 16-inch long RMI Forged Billets listed in the Rev. H SARP and Table 1 of this SER are conservative and meet the 10 CFR Part 71 requirements under NCT and HAC. The 16-inch long RMI Forged Billets addressed in this SER can thus be safely packaged and transported in the designated model of the SBWSC.

Approved:

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